for early surgical treatment compared with traditional delayed operation to realize the benefits in total management morbidity and mortality.

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Epilepsy Surgery for Hippocampal Sclerosis

HIPPOCAMPAL SCLEROSIS is the most frequent pathologic abnormality associated with medically intractable temporal lobe epilepsy. In fact, it is seen in a third of all cases in a random population of patients suffering from epilepsy, as reported both from autopsy cases and in histologic studies on temporal lobes removed during an operation for epilepsy. Hippocampal sclerosis indicates shrinkage and induration of specific regions of the hippocampus with histologic evidence of neuronal loss and secondary astroglial fiber proliferation. There is also a loss of inhibitory hippocampal interneurons and evidence of synaptic reorganization. Hippocampal sclerosis can be either unilateral or bilateral; in some autopsy series, more than half the patients with hippocampal sclerosis had bilateral lesions.

Patients in whom epilepsy manifests itself early seem to show evidence of hippocampal sclerosis more often than patients with late-onset seizures. Bilateral symmetric hippocampal sclerosis is associated with an early onset. The duration of epilepsy, however, does not correlate with the incidence of hippocampal sclerosis. Unilateral, predominantly selective, hippocampal sclerosis is seen in patients with epilepsy beginning later in life. Hippocampal sclerosis can also be seen in infantile spasms and in the Lennox-Gastaut syndrome.

Before any patient with seizures can become a surgical candidate, the patient must undergo a complete evaluation. Patients must be under the care of a neurologist and have seizures that are not controlled with appropriate anticonvulsant therapy. The history and physical examination, scalp interictal and ictal electroencephalograms, magnetic resonance imaging (MRI), and neuropsychological testing are all done to localize the region of epileptogenesis. If the site is localized, an intracarotid sodium amobarbital test should be done to identify the hemispheric distribution of language and memory. If memory cannot be supported by the temporal lobe contralateral to the proposed resection, then the patient is not a candidate for temporal lobe resection.

Magnetic resonance imaging findings help lateralize the seizure focus by showing hippocampal asymmetry. Hippocampal sclerosis may be detected as atrophy of the mesial temporal structures on T1-weighted images and increased signal intensity on T2-weighted images. Other MRI findings, such as atrophy of the adjacent temporal lobe and temporal horn dilatation, may be present. Computed tomographic scanning is rarely helpful because of the relatively poor resolution of the mesial temporal structures. Positron emission tomography may help define regions of functional abnormality, usually hypometabolism, in the suspected temporal lobe.

If the epileptic region is not sufficiently localized to proceed with surgical therapy after the noninvasive evaluation, then intracranial electrodes can be surgically implanted. To define an epileptogenic region thought to be in the limbic cortex, depth electrodes can be implanted in the amygdala and hippocampus through either the inferior or middle temporal gyrus or the occipital lobe. Subdural strip electrodes can also be placed against the inferior and mesial temporal cortex. Recording from lateral temporal or extratemporal neocortex is usually accomplished with subdural strip or grid electrodes placed over the area of interest.

The operation most often done is removal of the temporal lobe en bloc. The procedure should include resection of the amygdala and hippocampus. Depending on the presence of language function in the temporal lobe being removed, as well as the results of the electrical recordings done on the patient, 3.5 to 5.5 cm of lateral temporal lobe measured from the anterior pole is removed. The lateral extent of the resection may be less extensive than the mesial extent.

With this approach, the outcome for these patients is good. After the operation at least 70% of patients are seizure-free with medication or have only auras, 20% have more than 80% reduction in seizure frequency, and 10% have less than 80% reduction in seizure frequency. Most patients who are benefited by surgical treatment will be able to reduce the amount of anticonvulsants that they require, giving them an increased functional capacity. Morbidity from the various surgical procedures associated with epilepsy, such as hematomas or infections, is low, and operative mortality is rare.

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Approaches to Cervical Myeloradiculopathy

CERVICAL MYELORADICULOPATHY is a common cause of radicular pain and weakness in the arms and progressive leg weakness, spasticity, and gait disturbance in the later decades of life. There are two major presenting syndromes of the myelopathy. The first is the transverse syndrome that presents with spastic legs, disturbances of gait, and loss of joint position sense and vibratory sensation in the lower extremities. Individual patients will have varying degrees of severity of the different components. The second syndrome is called the central syndrome and is less common. Involvement is primarily in the upper extremities, where patients will show varying degrees of weakness and sensory loss. There is typically major involvement of the hands with weakness and atrophy of intrinsic hand muscles and sensory loss often associated with dysesthesias. Bladder dysfunction may also be seen. Combinations of the two syndromes are not uncommon.

Degenerative spondylotic myeloradiculopathy is thought